The CMS EVM project

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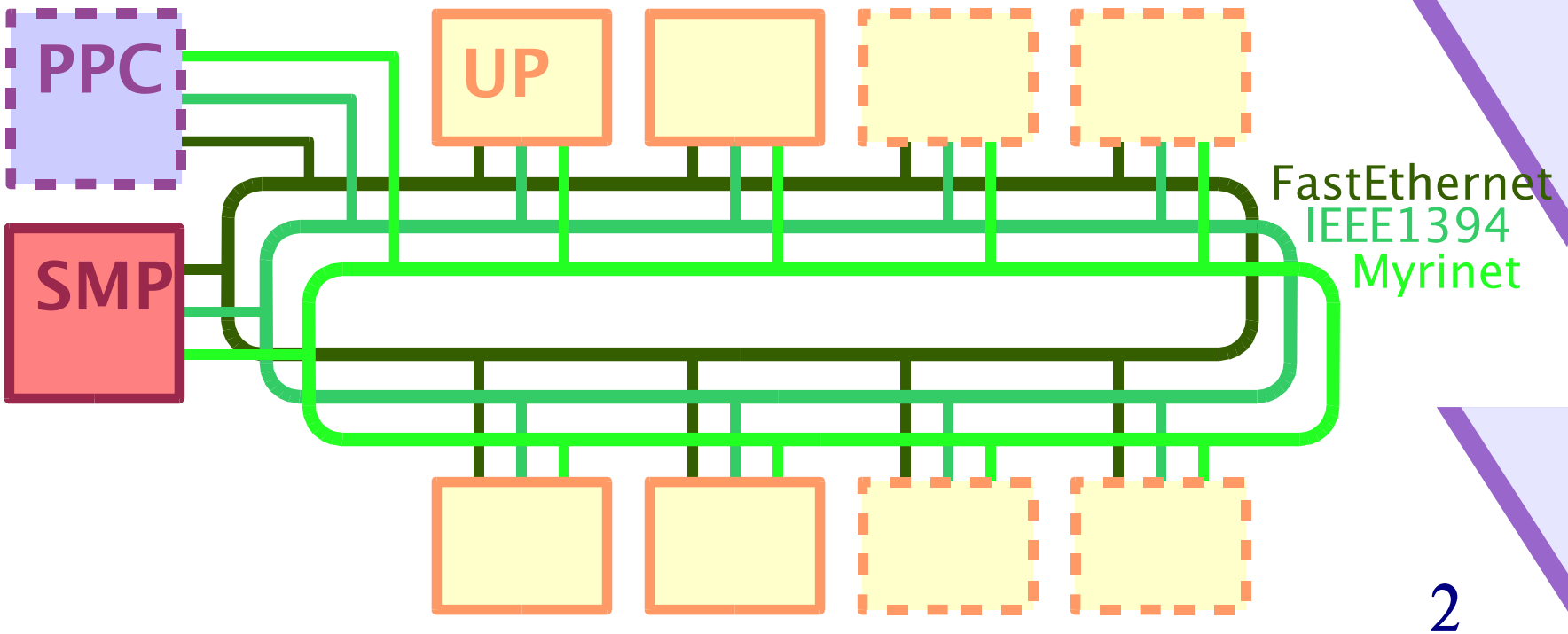
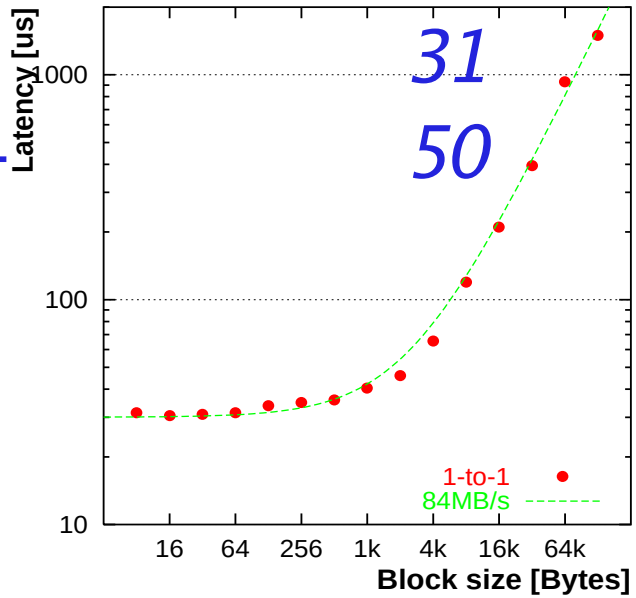
EVM: The test bench

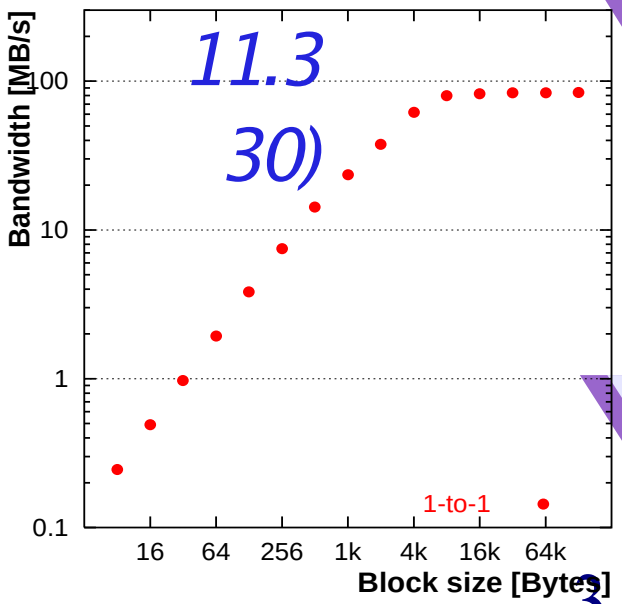
- A dual-CPU/PCI PC, 8 uni-CPU PCs and a VME PowerPC board
- Myrinet, IEEE1394 and two Ethernet NICs
- Linux 2.2.16 + special drivers



EVM: Network benchmark tests

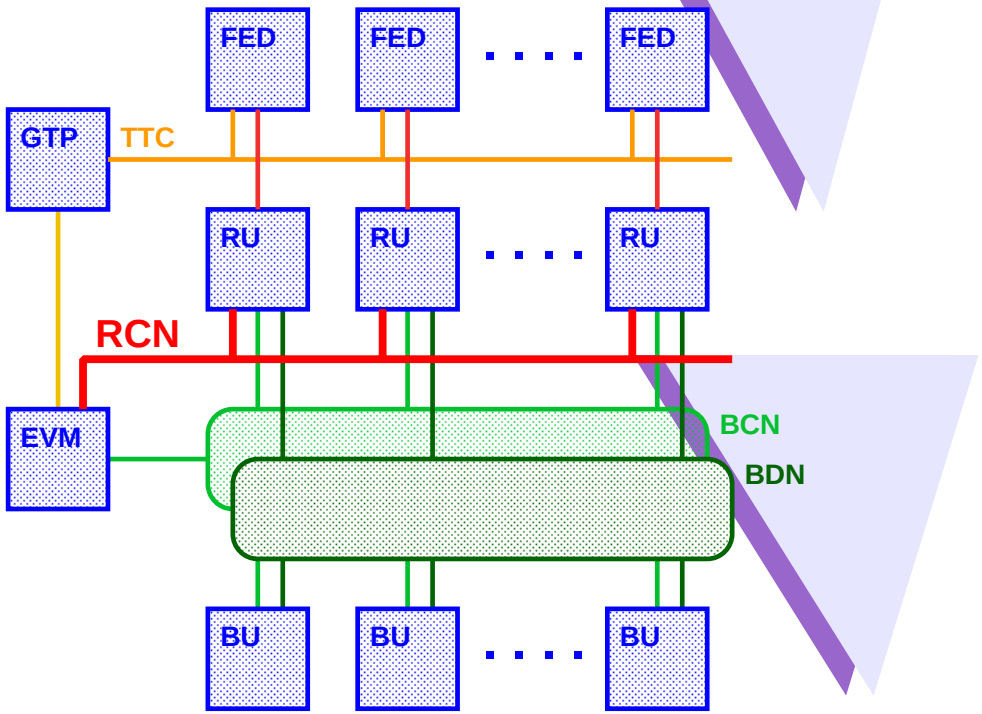
	Latency[us]	Bandwidth[MB/s]
Myrinet-GM	*30*	*84*
FastEthernet		
-TCP/IP	*72*	*11.6*
-UDP/IP	*53*	*9.6*
-M-VIA	*31*	*11.3*
(IEEE1394	*50*	*30)*





EVM: RCN protocol

- Requirements:
  - 100kHz input from GTP
  - less than 10ms latency
  - reliable delivery to the all RUs



- Implementation:
  - A reliable broadcast protocol was proposed.
  - Prototype was implemented on UDP/IP and technical feasibility was checked. → O.K.
  - Implementation for real use in the DAQ is in progress.

EVM: Simulation study

- To study behavior of the 500x500 DAS,
  - we need a small real system → Prototype systems
  - we need a simulator → EVBSIM
    - Simulator is checked with the real system in a small configuration.
    - Scalability is checked with the simulator.
- CNCL based simulator, EVBSIM, was modified.
  - All components (GTP, EVM, RUs, BUs, FUs, RCN, BCN and BDN) were implemented.
- Study on 4x4 system is in progress.

EVM: Summary

- Benchmark tests were done on Myrinet and FastEthernet using various protocols.
- Prototype RCN protocol was tested.
- All essential parts in the DAS was implemented in the simulation code.
- A prototype of the BM software was implemented based on XDAQ.
- Future work: IEEE1394 benchmark, RCN implementation and scalability/protocol studies compared with the simulation.